**Minor Project Details – 22MCE33P**

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| **Sl.No.** | **Minor Project Details** | **Components** |
| **1** | **Phase-I** | **Topic Selection, Synopsis, Objectives, Methodology** |
| **2** | **Phase – II** | **Design, Algorithm development/Implementation, Experimental setup/Conducting experiments, Testing.** |
| **3** | **Phase – III** | **Demonstration, Presentation, Teamwork Dynamics and ethics, Report** |

**Minor Project Information**

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| **College** | | **RV College of Engineering®, Bengaluru-560059** | | |
| **Department** | | **Computer Science and Engineering Department** | | |
| **Course :** | | **M.Tech in Computer Science and Engineering** | | |
| **Student Name 1:**  **Student Name 2:** | |  | **USN 1**  **USN 2** |  |
| **Project Title** | | **Title** | | |
| **Minor Project Duration:** | | **3 months** | | |
| **Internal Guide** | | | | |
| **Name** | **Dr.** | | | |
| **Designation** | **Professor** | | | |

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| **Signature of Internal Guide Dr. Hemavathy R Professor**  **RV College of Engineering** | **Signature of the HoD**  **Dr. Shanta Rangaswamy**  **Prof. & Head of the Dept, CSE**  **RV College of Engineering** |

**Signature of Dean CSE Cluster**

**Dr. Ramakanthkumar P**

**RV College of Engineering**

**Minor Project Synopsis**

**[paste Synopsis]**

**MINOR PROJECT EXECUTION PLAN**

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| **Sl. No.** | **Week wise plan** | **Planned Activities** | **Signature of Guide** |
| **1.** | **From Date:**  **To Date:** | **December 02, 2024 – December 07, 2024** |  |
| **Project activity carried out during for that week** | **Selection of technology domain to carry out the minor project. Selected biotechnology as a field of interest as the integration of computer science into biology has prosperous applications** |
| **2.** | **From Date :**  **To Date:** | **December 09, 2024 – December 14, 2024** |  |
| **Project activity carried out during for that week** | **Review the existing literature on Biotechnology Long Covid disease from various sources such as Nature, Elsevier, Springer. Identified the research gap that exists in the papers** |
| **3.** | **From Date:**  **To Date:** | **December 16, 2024 – December 21, 2024** |  |
| **Project activity carried out during for that week** | **Reformulate the problem statement, and objectives. Lay out the project plan to proceed. Study to get more background knowledge on the biotechnology and significance of genetic makeup** |
| **4.** | **From Date:**  **To Date:** | **December 23, 2024 – December 28, 2024** |  |
| **Project activity carried out during for that week** | **Lay out the Methodology of the project. Gather all the requirements that would be needed, and allocate time frame for completion of tasks** |

**MINOR PROJECT EXECUTION PLAN**

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| **Sl. No.** | **Week wise plan** | **Planned Activities** | **Signature of Guide** |
| **5.** | **From Date :**  **To Date:** | **December 30, 2024 – January 04, 2025** |  |
| **Project activity carried out during for that week** | **Obtain access to any tools, subscriptions required to complete the project. Consider the trade-offs between using different tools and techniques** |
| **6.** | **From Date :**  **To Date:** | **January 06, 2025 – January 11, 2025** |  |
| **Project activity carried out during for that week** | **Collect the data and carry out any pre-processing applicable on the data. Obtain complete and quality rich data to proceed next** |
| **7.** | **From Date:**  **To Date:** | **January 13, 2025 – January 18, 2025** |  |
| **Project activity carried out during for that week** | **Execute the processes on the preprocessed data. Compare the different tools and techniques manually and use the one that gives the best results** |
| **8.** | **From Date:**  **To Date:** | **January 20, 2025 – January 25, 2025** |  |
| **Project activity carried out during for that week** | **Prepare slides for minor project and present Phase 1 review. Gather feedback from the guide and resolve any roadblocks with the project** |

**MINOR PROJECT EXECUTION PLAN**

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| **Sl. No.** | **Week wise plan** | **Planned Activities** | **Signature of Guide** |
| **9.** | **From Date :**  **To Date:** | **January 27, 2025 – February 01, 2025** |  |
| **Project activity carried out during for that week** | **Provision the workstations from RVCE lab if processing is load heavy and requires higher computing power** |
| **10.** | **From Date :**  **To Date:** | **February 03, 2025 – February 08, 2025** |  |
| **Project activity carried out during for that week** | **Develop a streamed pipeline of the processes to automate the execution of the project. Write and test shell scripts to achieve automation** |
| **11.** | **From Date:**  **To Date:** | **February 10, 2025 – February 15, 2025** |  |
| **Project activity carried out during for that week** | **Map the results from the execution chain with the biotechnology platforms so the gene pathway mapping is labelled and achieved** |
| **12.** | **From Date:**  **To Date:** | **February 17, 2025 – February 22, 2025** |  |
| **Project activity carried out during for that week** | **Prepare slides for minor project and present Phase 2 review. Gather feedback from the guide and resolve any roadblocks with the project** |

**MINOR PROJECT EXECUTION PLAN**

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| **Sl. No.** | **Week wise plan** | **Planned Activities** | **Signature of Guide** |
| **13.** | **From Date :**  **To Date:** | **February 24, 2025 – March 01, 2025** |  |
| **Project activity carried out during for that week** | **Develop a user interface to facilitate the use of application to the end user. Implement web component using streamlit** |
| **14.** | **From Date :**  **To Date:** | **March 03, 2025 – March 08, 2025** |  |
| **Project activity carried out during for that week** | **Integrate the automation execution into the backend of the user interface application** |
| **15.** | **From Date:**  **To Date:** | **March 10, 2025 – March 15, 2025** |  |
| **Project activity carried out during for that week** | **Prepare the project report. Submission of the project and presentation of the demo** |

**Budget Details**

(Expenditure towards tools, Accessories, stipend etc.)

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| **Project Title** | **Gene Pathway Mapping and Clustering of Prolonged COVID-19 (SARS-CoV-2) Virus** |

**Hardware and software tools cost for complete duration of the project:**

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| **Sl. No.** | **Name of the H/W and S/W tool.** | **Specification (in brief)** | **Unit price in** ₹ | **Total Unit/ Quantity required** | **Estimated cost (in** ₹**.)** |
| 1. | QIAGEN CLC Genomics Workbench | Student Version | 79$ | 1 | 79$ |
| 2. | Samtools and BCFTools | Open Source | 0 | 1 | 0 |
| 3. | FreeBayes | Open Source | 0 | 1 | 0 |
| 4. |  |  |  |  |  |
| **Total Cost** | | | | | 79$ |

**Minor Project Evaluation Remarks**

Date **of Presentation: 25-01-2025**

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| **Phase - I Evaluation Remarks:** |
| **Signature of the Committee**  **1.**    **2.**    **3.**  **Phase - II Evaluation Remarks:**  **Signature of the Committee**  **1.**    **2.**    3. |

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| **Phase - III Evaluation Remarks:** |
| **Signature of the Committee**  **1.**    **2.**    **3.** |

**OUTCOMES OF THE MINOR PROJECT**

* The project focuses on the analysis of genomic sequences to identify and characterize genetic variants within a reference genome.
* By utilizing a suite of bioinformatics tools, the project integrates several key steps, including sequence alignment, variant calling, and impact assessment, to provide a comprehensive analysis of genomic data.
* This contributes to the field of Bioinformatics an effective tool that can be extended to analyze the genetic variation of other emerging organisms and derive insights
* Clustering of Prolonged Covid SARS-Cov-2 virus: Clustering the affects and syndromes region-wise and country-wise
* Gene Pathway Mapping of Covid SARS-Cov-2 virus: Mapping the syndromes of the virus with the specific gene pathways that will determine the organs and pathways affected because of the long covid disease

**RUBRICS**

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| **MINOR PROJECT PHASE-1 MCE461P** | | | | | | |
| **Sl. No.** | **Project Work** | **Marks/**  **CO** | **Excellent** | **Good** | **Average** | **Poor** |
| 1. | **Topic Selection** | **02**  **CO1** | Presents comprehensive view of the topic with proper literature survey, compelling recommendations with excellent justifications and evidence for topic selection. | Provides good overview of the topic with a good survey, support their recommendations with good justifications and evidence for topic selection. | Provides average survey but survey is not well supported with justification for topic selection. | Does not provide a comprehensive view of the survey for the topic and has no evidence to support it for topic selection. |
| **(2)** | **(1.5)** | **(1)** | **(0)** |
| 2. | **Synopsis** | **03**  **CO1** | The Synopsis contains key points with complete information about the topic selected. | The Synopsis contains few key points and adequate information related to the topic selected. | The Synopsis contains very few key points or information is incomplete or missing. | The synopsis does not contain key points and information contained is irrelevant. |
| **(3)** | **(2)** | **(1)** | **(0)** |
| 3. | **Literature Survey** | **03**  **CO2** | Demonstrates comprehensive review of research papers/literature related to project topic; student identifies limitations of the existing literature (around 12-15 papers) | Demonstrates comprehensive review of research papers/ literature related to student’s topic; student identifies sufficiently the limitations of the existing literature (around 12-10 papers) | Demonstrates comprehensive review of research papers/ literature related to project topic; student is unable to identify the limitations of the existing literature (with only 4-5 papers) | Unable to demonstrate comprehensive review of research papers/literature related to project topic; and is unable to identify the limitations of the existing literature |
| **(3)** | **(2)** | **(1)** | **(0)** |
| 4. | **Motivation** | **02**  **CO1** | Student is highly motivated based on the literature survey and research gap studied and demonstrates accurately and professionally the concepts | Student is motivated based on the literature survey and research gap studied and demonstrates adequately the concepts | Student is less motivated based on the literature survey and research gap studied and demonstrates the concepts with less clarity | Student is least motivated and does not demonstrate accurately and professionally the concepts |
| **(2)** | **(1.5)** | **(1)** | **(0)** |
| 5 | **Problem Formulation** | **05**  **CO3** | Student is able formulate the problem statement clearly | Student is able formulate the problem statement not so clearly but has some information | Student is unable define the problem statement adequately | Student is unable define the problem statement clearly and is ambiguous |
| **(05)** | **(04)** | **(03-02)** | **(01)** |
| 6 | **Project Objectives** | **05**  **CO3** | Objectives are clearly articulated and sufficient background is provided | Objectives are sufficiently articulated and some background is provided | Objectives are articulated to reader and background is not provided | Objectives are not clearly articulated |
| **(05)** | **(04)** | **(03-02)** | **(01)** |

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| **MINOR PROJECT PHASE-II MCE461P** | | | | | | |
| **Sl. No.** | **Project Work**  **(Meets Criteria)** | **Marks/CO** | **Excellent** | **Good** | **Average** | **Poor** |
| 1. | **Design** | **10**  **CO1** | Presents highly specific design concepts related to the topic. Division of problem into modules and good selection of computing framework. | Presents moderately specific design concepts related to the topic. Division of problem into modules and good selection of computing framework | Produces design concepts adequately related to the topic. Division of problem into modules but inappropriate selection of computing framework | Does not produce design concepts well. Partial division of problem into modules and inappropriate selection of computing framework |
| **(10-9)** | **(8-6)** | **(5-3)** | **(2-1)** |
| 2. | **Methodology** | **05**  **CO3** | Key development decisions are well identified and/or compared and uses appropriate logic with a suitable algorithm | Key development decisions are sufficiently identified and appropriate algorithm has been identified | Key development decisions and algorithms are not identified and/or compared properly | Key development decisions are missing and appropriate algorithm not identified |
| **(5)** | **(4)** | **(3-2)** | **(1)** |
| 3. | **Algorithm development/**  **Implementation** | **10**  **CO3** | Algorithm developed is relevant and implements complete solution to the problem. | Algorithm developed is relevant and appropriately implements solution to the problem | Algorithm developed is relevant and does not implement appropriate solution to the problem | Algorithm developed is not relevant and partially implements solution to the problem |
| **(10-9)** | **(8-6)** | **(5-3)** | **(2-1)** |
| 4. | **Experimental setup/Conducting experiments** | **10**  **CO3** | Ability to assess the performance and results are presented in tabular and/or graphical form, summarizes results; discussion of results is focused and proposed the topic/research development | Ability to assess the performance and make certain performance-related decisions and results are in tabular and/or graphical form, discussion of results is focused and proposed the topic/research development | Performance is assessed to certain extent and performance-related decisions are not discussed and results are not tabulated not proposed the topic/research development | Unable to assess the performance and make performance-related decisions and results not in tabulated and not focused to proposed the topic / research development. |
| **(10-9)** | **(8-6)** | **(5-3)** | **(2-1)** |
| 5 | **Testing** | **05**  **CO4** | Application developed is tested thoroughly for all test cases covering unit and integration testing | Application developed is tested sufficiently for all test cases covering unit and integration testing | Application developed is tested for some test cases covering unit and integration testing | Application developed is not tested thoroughly for all test cases involving unit and integration testing |
| **(5)** | **(4)** | **(3-2)** | **(1)** |

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| **MINOR PROJECT PHASE-III MCE461P** | | | | | | |
| **Sl. No.** | **Project Work**  **(Meets Criteria)** | **Marks/CO** | **Excellent** | **Good** | **Average** | **Poor** |
| 1. | **Demonstration** | **15**  **CO2** | Demonstrates all the defined objectives as per schedule | Demonstrates most of the defined objectives | Demonstrates few of the defined objectives | Demonstrates very few defined objectives |
| **(15-13)** | **(12-9)** | **(8-5)** | **(4-1)** |
| 2. | **Presentation** | **10**  **CO2** | Gives an effective presentation covering key points. Is confident, clear, demonstrates results well | Is confident, clear, demonstrates results adequately well | Is confident but does not demonstrate results well | Is not confident and does not demonstrate results well |
| **(10-9)** | **(8-6)** | **(5-3)** | **(2-1)** |
| 3. | **Teamwork Dynamics and ethics** | **05**  **CO4** | Both are actively involved and motivated and adhere to ethical principles. | Both are participating but still needs co-ordination and adhere to ethical principles. | Only one is participating and other is passive and does not adhere to ethical principles. | Both are passively presenting without motivation and do not adhere to ethical principles. |
| **(5)** | **(3-4)** | **(2)** | **(1)** |
| 4. | **Report** | **10**  **CO2** | Report is documented well with concepts and results are presented well with pictorial representation. | Report is well documented with concepts and only partial results presented pictorially. | Report is not well documented with concepts but results are presented well pictorially. | Report not documented well. Most of the concepts are missing. Poor presentation of results. No pictorial representation. |
| **(10-9)** | **(8-6)** | **(5-3)** | **(2-1)** |